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NAVY DEPARTMENT

BUMED NEWS LETTER

a digest of timely information

Editor - Captain F. W. Farrar. (MC). U.S.N.

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Spread of Poliomyelitis: Epidemiological data collected during the past few years have strengthened the belief that poliomyelitis is spread through person-to-person contact and for the most part by material ejected through the nose and mouth as a result of activity involving the respiratory system. Evidence of a convincing nature is lacking to indicate that the disease is water-borne, frequently spread via food, or commonly transmitted by arthropods.

In 1945 Howe and associates recovered the virus from secretions swabbed from the oropharynx in a certain proportion of recognized cases. It was possible to recover the virus only during the period not exceeding 4 days after onset of the disease.

During an interepidemic period the virus was recovered by Kessel and Moore from several pools of tonsils removed from children admitted to Los Angeles hospitals.

Aycock, in reporting on 49 cases in which there had been limited exposure to a previous case, stated that of 17 cases of poliomyelitis in which there was a history of single exposure, this exposure occurred in 16 between the fourth day before and the fifth day after onset in the primary case. Casey noted in an investigation carried out in Alabama that in 30 of 36 cases which resulted from a single exposure, contact took place within the period of 3 days before and 4 days after the onset of the disease in the primary case. He noted the same high incidence of person-to-person contacts in Chicago during a non-epidemic year. Several similar instances have been reported in which the disease occurred following a definite contact exposure to a patient just prior to or just after clinical onset.

Brown, Francis, and Pearson have reported finding poliomyelitis virus in the stools of a patient 19 days before onset of the disease with paralysis. They found that 7 persons, including the patient just mentioned, were intimately exposed to an individual during the period of from 4 days before to 2 days after he manifested the disease clinically. This group was made up of lodgemates in a summer camp. Five of 6 stool specimens collected from boys in the lodge 6 days after the last exposure contained poliomyelitis virus. Stools and throat washings from boys in other cabins were negative.

The author feels that the observations made, placing the transmission of infection in the interval between a few days before and a few days after the clinical onset of the disease, in conjunction with the findings of Howe that virus can be recovered from the secretions of the oropharynx in a large proportion of cases not longer than 4 or 5 days following onset, are highly suggestive of spread through secretions of the oropharynx. However, the author states that it is quite probable that the majority of infections are transmitted by persons who exhibit no recognizable symptoms, rather than by persons who have recognized cases of the disease.

In conclusion the author observes that the role of the feces in the dissemination of poliomyelitis is unknown at the present time. However, outbreaks have

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not been observed in which it has been proved that they have played a definite part. Furthermore, it has not been demonstrated that a close correlation exists between incidence of the disease or infection and sanitary conditions of the environment either in the home or the community. The concept of spread of infection by transfer of secretions from the oropharynx through person-to-person contact continues to be the only one which is consistent with observed facts. (U.S. Pub. Health Reps., 20 Jun '47 - C. C. Dauer)

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Biochemical Study of Patients with Gastric Cancer: For 5 years there has been in progress at the Memorial Hospital and, more recently, at the Sloan-Kettering Institute an intensive biochemical study of patients with gastric cancer. The Gastric Service of Memorial Hospital, under Dr. George T. Pack, provided the clinical material for the work here reported and also participated in the studies.

A ward for the study of metabolism has been created in which patients may be maintained without charge for long periods. This ward is air-conditioned and has its own specially trained medical and nursing staff. A diet kitchen with its own staff of dietitians responsible for no other duties is available. Supplies of standardized food are provided. The laboratory is in charge of a biochemist. Special facilities for record keeping and for tabulation of data are at hand.

Changes in Carbohydrate Metabolism. The almost uniform malnutrition found in patients with gastric cancer is striking and demands explanation. The malnutrition bears no clear relationship to dietary intake, nor can any disturbance of digestion or internal absorption of food explain the progressive weight loss. For these reasons, patients with gastric cancer were suspected of metabolizing the absorbed foodstuffs by abnormal and inefficient mechanisms. The mechanisms which thus far have received the greatest attention have been those involving carbohydrates.

Under the experimental conditions adopted, the average concentrations of glycogen in the livers of control subjects who had fasted and of those with gastric cancer were the same. However, when both groups were given orally comparable amounts of glucose before operation, the average glycogen concentration increased 3 times in livers of the control subjects but only 1.4 times in patients with gastric cancer. A deficient activity of (1) insulin, or (2) certain adrenal cortical hormones was considered among the possible explanations for the relative inability of those with gastric carcinoma to convert glucose to liver glycogen.

Deficient activity of insulin did not appear to be the cause, because the administration of glucose and insulin (from 30 to 60 units) to a second group of patients with gastric carcinoma did not repair their limited hepatic glycogenesis. On the other hand, when adrenal cortical extract (Upjohn, aqueous) was injected during

the glucose feeding of a third group of patients with gastric cancer, their average liver-glycogen concentration was found to be normal.

No significant reflection of a disturbed hepatic glycogenesis in patients with gastric cancer could be found by other clinical studies. Although the intravenous-glucose tolerance curves of these patients demonstrated mildly elevated average fasting and peak blood-sugar levels, the rate of disappearance of the injected glucose was not abnormal. Likewise, no significant alteration of the respiratory quotients of these patients before or after glucose injection was found.

Changes in Protein Metabolism in Patients with Gastric Cancer. Previous studies in this laboratory revealed that regardless of adequate food intake there is a high incidence of hypoproteinemia in patients with gastric cancer. The disturbance has been shown to be amenable in some degree to preoperative feeding of large amounts of protein. Because of the hazard presented by hypoproteinemia in patients who require surgical procedures, it is important to know the mechanism by which the abnormality results.

To ascertain whether patients with gastric cancer could form plasma proteins in the presence of a sufficient nitrogen intake, nine patients were placed on a high protein diet as soon as possible after operation. Their regeneration of plasma protein was measured by electrophoretic technics and by Howe's chemical method. Plasma volumes were determined by the use of Evan's blue. In six cases complete nitrogen-balance studies were made. One patient with gastric cancer was studied for 27 days, the others for from 11 to 15 days. Three patients with gastric ulcers served as control subjects under similar conditions.

These studies showed that in patients with gastric resection for ulcer total circulating plasma albumin and plasma globulin increased under the conditions of the experiment; in patients with gastric resection for cancer they remained unchanged or decreased. Most patients with gastric cancer lost further plasma protein.

The A/G ratios were reversed in all cases of gastric cancer; and, in two patients with cancer who showed plasma protein regeneration, it was due to the formation of globulin only. No increase in albumin levels could be demonstrated.

These findings suggest that patients with gastric cancer do not regenerate plasma proteins because of a defect in the mechanism of protein synthesis or because of abnormal distribution of protein. It is of interest to note that the changes of the A/G ratio described in the literature are probably even greater than has been supposed. This is due to the fact that under certain circumstances alpha globulins may be determined by Howe's method as albumin. This finding led to a study of the value of the current methods of protein determination. A comparison was made between the results obtained by Howe's method, the falling-drop method, the methanol fractionation method, a new immunologic method of

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fractionation of Dr. Bacon Chow, and the procedure of electrophoresis.

Results of blood protein determination by the falling-drop method were compared in 69 cases with results of Kjeldahl determinations done within 24 hours of each other. In general, the falling-drop results were higher than the Kjeldahl. The results were found to agree within ± 0.1 Gm. in only 21.7 per cent. Of those failing to agree within ± 0.1 Gm., 68.5 per cent was too high, and 31.5 per cent was too low. The greatest variations observed were not more than 1.4 Gm.

When electrophoresis of plasma is performed at pH 8.6, both patients with gastric cancer and patients with gastric ulcer have low plasma albumin concentrations. Patients with gastric cancer have in addition some increase of plasma alpha globulins and fibrinogen. Small amounts of material more highly charged than albumin are also frequently found.

Plasma albumin, as measured by Howe's method, corresponds roughly with the sum of the electrophoretic albumin and alpha globulins. In the plasma of patients with gastric cancer receiving casein hydrolysate and high protein diets, however, the Howe albumin values often change markedly, quite independent of the electrophoretic albumin.

A series of analyses has also been made of the plasma of patients with lymphatic leukemia, myelogenous leukemia, lymphosarcoma, and Hodgkin's disease. The plasma albumin levels of these patients were low. There was also occasionally a large increase in gamma globulin. In four patients no change in plasma proteins was found after nitrogen-mustard therapy. A small amount of material moving faster than albumin was found in the plasma of a few of the untreated patients. Some of these studies are being repeated when the material for analysis is brought to pH 4.0.

At pH 4.0, a definite component of mobility = -2.70×10^{-5} cm.^{2}/second/volt separates sharply from the plasma proteins. The plasma of patients with gastric cancer contains from 130 to 210 mg. per cent of this material (average 170); normal individuals have from 60 to 120 mg. per cent (average 80). Two patients whose tumors had been removed had plasma concentrations of 100 and 110 mg. per cent. Patients suffering from malnutrition with ulcers and other noncancerous disorders, as well as patients with other types of cancer, are now being studied.

Alterations of Electrolyte Exchanges. Disturbances in the distribution and balance of electrolyte and water are known to be associated with certain adrenal disorders. Isolated adrenal steroids have been shown to affect salt and water excretion and to correct the electrolyte changes which accompany adrenal insufficiency in animals and in man. Several diagnostic procedures based on these changes have been found useful in cases of suspected adrenal disorder, and these tests were applied to patients with gastric cancer in order to investigate the connection, if any, between the existence of the neoplasm and an adrenal hormonal imbalance.

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Kepler and associates have developed a test which is useful in the diagnosis of Addison's disease. Briefly stated, the test consists of giving fluid and sodium chloride equivalent to 2 per cent saline for a period of 2 days. A large amount of water is given at the end of this period, and the excretion of sodium chloride and water is measured over a period of 4 hours. Thus far, the results of this test in patients with gastric cancer resemble more nearly those seen in Addison's disease than those present in any other disorder of known cause; nevertheless, age, state of nutrition, and other factors known to be directly related to adrenal function also influence the results.

A normal diuretic response to water given without salt has been demonstrated in two patients with gastric cancer in whom it has been tested. This observation, made at the suggestion of Dr. H. W. Smith, is important since it makes improbable the involvement of the antidiuretic factor of the pituitary.

Cutler, Power, and Wilder have applied a salt-depletion test to demonstrate the impaired ability of patients with Addison's disease to conserve sodium when necessary. Two patients with gastric cancer have been subjected to this procedure, and both gave similar responses to those given by patients with Addison's disease.

Soffer and co-workers have shown that in Cushing's syndrome, desoxycorticosterone acetate increases the excretion of injected sodium chloride under certain conditions in contrast with the decrease observed in normal subjects. A normal response to this test was observed in one patient with gastric cancer who had shown a reaction similar to that of patients with Addison's disease to the Kepler and Wilder procedures. This patient was in good nutritional condition and is one of the group who failed to regenerate plasma protein on a high-calorie, high-protein diet.

Immediate postoperative salt intolerance is a well-established fact. Amounts of salt easily excreted by a normal individual lead to salt retention and edema if administered immediately after major surgery. It has been the experience here that patients with gastric cancer in the postoperative phase are particularly susceptible to salt "poisoning." Measurements of extracellular fluid by the thiocyanate method before and after operation combined with sodium-balance studies and measurement of plasma-sodium concentration provide no explanation of the fate of the sodium retained. It may be postulated that sodium has passed into the cells in significant amounts. The conclusive demonstration of such a shift would be of interest.

Summary. This paper presents a condensation of the studies of the author and co-workers on patients with gastric cancer. These studies, undertaken because of the high incidence and poor cure rate of gastric cancer, have yielded results which have helped to decrease postoperative morbidity and mortality and have increased the scope of resectability. Besides this practical gain, the studies have provided new knowledge of the systemic disease occurring in patients with gastric cancer. Whether this disturbance is of etiologic importance

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remains to be determined. Detailed knowledge of the condition is in any case most necessary for the proper management of these patients. (J. Nat. Cancer Inst., April '47 - C. P. Rhoads)

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Serum Protein Changes in Myelogenous and Lymphocytic Leukemias and Hodgkin's Disease: Because, generally, the impression was gained from the literature that there were marked changes in plasma proteins in Hodgkin's disease, myelogenous leukemia, and lymphatic leukemia which might be related to the hematologic picture, a study to ascertain such changes was undertaken using analytical methods which have proved to be reliable.

Employing a methyl alcohol fractionation technic, the albumin, globulin, and total protein levels were determined in a series of normal adults and compared with those in a series of patients with myelogenous and lymphocytic leukemias and Hodgkin's disease. Statistically significant decreases in albumin and increases in globulin were found in the patients with Hodgkin's disease and myelogenous leukemia, but without significant changes in total protein. Globulin levels above the highest normal value were found in 23 per cent of the former and 33 per cent of the latter group. No apparent relationship was noted between the levels of the serum protein fractions and (1) the hemoglobin level, (2) the erythrocyte count, (3) the peripheral white blood cell picture, or (4) the bone marrow smears.

That only one third of the series of patients with myelogenous leukemia and only one fourth of those with Hodgkin's disease showed increases in the serum globulin levels raises the question of the significance of these changes. The finding of a higher percentage of patients in both disease groups showing a decrease in albumin is consistent with the nutritional failure associated with a chronic wasting disease. A point worth emphasizing is that in the cases of hyperglobulinemia the total protein levels were within normal limits because of the simultaneous decrease in serum albumin. The inadequacy of a total protein determination as a measure of serum protein change thus is obvious.

In multiple myeloma, a disease usually associated with a marked hyperglobulinemia, Gutman et al. found that 63 per cent of 38 patients studied had elevated globulin levels. Not only did the group of patients with multiple myeloma show an incidence of hyperglobulinemia of from 2 to 2.5 times that reported here for myelogenous leukemia and Hodgkin's disease, but the levels of globulin in these patients with hyperglobulinemia were much higher than those reported in this study. Thus, when compared to a disease like multiple myeloma, the globulin changes in myelogenous leukemia and Hodgkin's disease are not particularly striking.

It is important to recognize that the serum globulin fraction is not a single entity and that it is actually made up of a large number of different proteins. It

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is conceivable that significant changes in one or more of the globulin components may occur in cases of Hodgkin's disease and myelogenous and lymphocytic leukemia without being reflected in the total globulin determination. However, electrophoretic analyses of a similar series of cases will be necessary before such a possibility can be evaluated. (Blood, J. Hematol., July '47 - G. A. Nitshe, Jr. and P. P. Cohen)

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Operations on the Vagus Nerves in the Treatment of Peptic Ulcer: The majority of surgical operations accomplish their purpose in an obvious manner, in that they remove grossly diseased tissue or repair injuries and defects. Examples are the amputation of a gangrenous leg and the repair of a hernia. A much smaller number of procedures are carried out because of more subtle effects which are produced as a result of anatomically small but physiologically potent structural alterations in endocrine gland and nervous tissue. The removal of a small parathyroid adenoma may stop a demineralizing process which is weakening many areas of the skeleton. The removal of a thyroid gland, an islet cell adenoma of the pancreas, or an adrenal tumor is likely to change the whole outlook for the patient. The cutting of the white fibers in the frontal lobes has resulted in favorable personality changes; the pain of malignant disease in a remote area of the body has been relieved by a small properly placed incision in the medulla. There are circumstances which make it advisable to paralyze certain muscles by depriving them of nerve supply. A diseased lung is put at rest by crushing the phrenic nerve to its half of the diaphragm. The obturator nerve is cut to prevent troublesome adductor contractions in the spastic child. Sympathetic nerves and ganglia are removed to paralyze the smooth muscle in arterioles and diminish peripheral resistance, thus lowering blood pressure.

Until recently, there has been no good example of the surgical interruption of the nerve control of a secretory organ in order to achieve a therapeutic result. Section of the vagus nerves to the stomach in patients with peptic ulcer represents the prime example of that type of surgical approach. It is easy to think of ulcer as being due to disturbed physiology. The hyperacidity of gastric juice in ulcer patients has been known for a long time. Dragstedt and his co-workers have shown that the night and resting secretions of gastric juice in such patients is increased over that of patients without ulcer. They have stated that this excessive secretion appears to be due chiefly to an abnormally great secretory tonus in the vagus nerves and is reduced to normal values by complete vagus section.

Several groups of workers are now evaluating the new physiological surgical treatment of ulcers as thoroughly and as rapidly as possible. Of Dragstedt's patients which number more than one hundred seventy, many have been followed for three or four years, and he is still enthusiastic about the procedure. Francis Moore and his co-workers have made careful observations over a two-year period on forty patients treated by vagus resection. Their results have been

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distinctly encouraging. Grimson and his group have reported on twenty-five patients: they have emphasized some of the undesirable symptoms occurring in the immediate postoperative period, the most important of which relates to the early hypomotility.

An early solution to the problem of the ultimate value of section of the vagus nerves to the stomach has not been promoted by the giving of undue attention to minor differences in technic and terminology. In the first place it should be clear that a subtotal resection of the stomach, to which a subdiaphragmatic section of the vagi has been added, should be included in a category apart from that of pure vagus section. At most, a series of such patients would be of value only to indicate the prophylactic value of vagotomy in the prevention of jejunal or marginal ulcer. On the other hand, the nerve operation was never calculated to open up a stenosed pylorus in which resection or by-passing surgical procedures are plainly indicated.

Originally, Dragstedt used the transthoracic approach to the vagi; recently, he has favored the transabdominal route. It appears that a clean section can usually be accomplished either way. At the present time there is no proof that it makes any difference what is done with the ends of the nerves after they are cut. They may be stripped upward and downward and resected, the proximal ends can be transplanted out of the mediastinum, or non-absorbable caps can be placed over them. The important thing seems to be to get them cut (including any branches). (Am. J. Surg., Aug. '47 - Editorial - C. R. Lam)

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Granuloma Inguinale Treated with Streptomycin: With the recent demonstration of the bacillary nature of the Donovan body it was felt that a study of the effect of an antibiotic on the disease was warranted. Inasmuch as adverse reports on treatment with penicillin had been published, it was decided to limit this study to the effect of streptomycin on granuloma inguinale.

Accordingly, 3 patients, who presented clinical evidence of granuloma inguinale and who had not received any specific therapy for the disease prior to entering the Center, were selected. Freedom from syphilis, chancroid, and lymphogranuloma venereum was established, as far as darkfield examination, serologic tests, cutaneous tests, and clinical examinations were concerned. In all 3 patients Donovan bodies were demonstrated prior to the initiation of therapy.

After intramuscular injections of streptomycin of from 20,000 to 30,000 micrograms every 3 hours for 41, 18, and 29 days, all 3 patients showed excellent clinical improvement with disappearance of Donovan bodies from the lesion. The 2 patients who had been treated for 18 and 29 days exhibited relapse after the supply of streptomycin was exhausted. The patient who was treated with streptomycin for 41 days was observed for 2 and 1/2 months after the

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completion of therapy with no evidence of relapse.

It is admitted that the daily dosages of streptomycin (from 160,000 to 240,000 micrograms) administered to these patients were small. The supply of streptomycin, however, was limited, and in view of the experience with other antibiotics in the treatment of syphilis it was deemed wiser to protract the treatment period, using small doses, than to expend all of the drug over a short period of time. It is possible that more spectacular results might be achieved using larger amounts of streptomycin. (Arch. Dermat. and Syph., July '47 - R. L. Barton et al.)

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Hydrazine Hydrate: Because personnel at naval activities other than at air stations may on occasion handle or use hydrazine hydrate, the notes on this chemical which appeared in the June 1947 issue of the Aviation Supplement of the Bumed News Letter are reprinted in substance here:

Hydrazine hydrate is the monohydrate of hydrazine. Its formula is N_2H_5OH. As a base it is approximately 8 times weaker than ammonium hydroxide. It is a water-clear, highly refractive, hygroscopic liquid of oily consistency which fumes on exposure to air. It mixes with water, methyl alcohol, and ethyl alcohol. It is insoluble in ether, chloroform, and benzol. Its specific gravity is 1.03; its melting point is -40° C.; and its boiling point is 115.5° C. A mixture of 25 per cent hydrazine hydrate vapor with air is inflammable and explosions frequently result. Therefore, it is necessary to keep it in properly sealed containers.

Following a moderate or heavy exposure to the vapor which violently affects the nose and throat, the symptoms are easily recognized and treated.

The effects of slight exposure, however, may confuse the medical officer if he is not experienced with this chemical. The person affected is usually admitted complaining of pain and itching of both eyes. He will give a history of exposure to hydrazine hydrate approximately 4 hours previously, at which time he was unaware of the vapor being present. The conjunctiva is red and swollen. Severe edema of the lids and bulbar conjunctiva with small bleb formation is present in 24 hours. The pain becomes more severe and the condition progresses until the eyes are completely shut. On the third day the swelling starts to subside and the pain lessens. On the fourth day the eyes may be opened. Complete recovery takes place in about a week.

Treatment is most effective when begun promptly after early recognition of the cause of the condition. Use boric acid irrigation for both eyes and apply boric acid paste under the lids. Tetracaine hydrochloride (pontocaine) in 0.5 per cent solution accompanied by cold compresses may be used in the relief of pain. Adrenalin in 1:10,000 solution may also be helpful. The boric acid

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irrigation and paste application should be repeated every 4 hours during the first 24 hours.

Medical officers at activities where this chemical is used should assure themselves that all precautions are taken for the protection of personnel. Persons who handle the chemical should receive instructions regarding its nature. Goggles and a closed breathing apparatus should be worn whenever transfer of the chemical is made from storage drums to tanks. Instructions should be given, in case the chemical is spilled on the skin, to wash the contaminated area immediately with copious amounts of water and apply boric acid paste. It is advisable to keep this paste stored in the working area.

Workers handling this chemical should report weekly for routine blood counts and urine analysis.

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Dissolution of Vesical Calculi: In August 1943, the author reported one of the early cases of a large bladder calculus dissolved by solution G of Suby et al. which has the following composition:

Citric acid (monohydrate)	32.3 Gm.
Magnesium oxide (anhydrous)	3.8 Gm.
Sodium carbonate (anhydrous)	4.4 Gm.
Distilled water ad	1000 c.c.

Since 1943, the solution has been used in a number of other conditions, but its greatest applicability is in the dissolution of bladder calculi, and to date it has been used successfully in a total of 10 cases. In only 1 instance has it proved unsuccessful. This was with a patient who had a large bladder calculus measuring 5.5 cm. At operation the calculus was found to be very soft and friable and on the point of disintegration. It was believed that if continued irrigations had been used, the calculus would have responded to treatment. In paraplegics, this method of removal of bladder calculi is deemed the method of choice because of the frequency of occurrence of calculi in these patients, the tendency to recur, and the desire to avoid operative procedures.

In a total of 35 paraplegics, bladder calculi occurred in 7 who were treated with solution G for from 6 to 44 days (the average being 14 days) with complete disintegration of the calculi.

The procedure employed is a simple one. A discarded Foley catheter is used. The balloon portion of the catheter is removed and the solution is allowed to run in through this opening. The catheter is inserted and fixed in place with adhesive. The solution flows continuously at the rate of 80 drops per minute and returns through the large eye of the catheter into a receptacle placed at the foot of the bed. The continuous irrigation brings a constant concentration of

solution in contact with the calculi at all times and removes collected detritus. The solution exerts a solvent action and loosens the organic matrix. Usually 24 hours is required before sediment appears in the irrigation returns. When gravel is no longer noted, it is an indication that the stone has disappeared. In general, the solution was found to be relatively non-irritating. In one case there was fever which was probably not associated with the irrigations.

Although there was an incidence of 20 per cent of those with bladder calculi among the 35 paraplegics, later, others in this group will probably form stones, thus making an even higher percentage of incidence. The development of calculi has been blamed on recumbency of the patients, leading to demineralization of the skeleton and the formation of renal stones. Bladder calculi in these cases are formed by continuous accretion of salts after a small calculus has passed into the bladder, or the calculus may form in the bladder itself. The latter is due to constant residual urine, hypercalcinuria and infection. The calculi are usually composed of phosphates and carbonates. These grow rapidly by surface accretion. In one case of this series, however, analysis of a calculus passed spontaneously revealed calcium oxalate to be the chief constituent. The remaining large calculus in this patient was dissolved by irrigations. Dissolution is much to be preferred to cystotomy or litholapaxy. An operative procedure such as cystotomy may be attended with the possibility of a persistent draining sinus or disturbance in the automatic function of the bladder. Litholapaxy is a traumatizing procedure which one hesitates to use in these patients. Two cases have been seen in which it was used and in which rupture of the bladder occurred.

Some of the other uses of solution G may be briefly mentioned. In alkaline-encrusted cystitis it is the treatment of choice. The author has also used this solution after the surgical removal of renal calculi in order to remove any calcareous deposits, encrustations or small calculi that might have been overlooked. The irrigations are performed by a trained attendant for from 5 to 10 minutes every 2 to 3 hours after bleeding has ceased. In one patient who was given irrigations for 11 days following nephrotomy for a large recurrent calculus, there was no evidence of recurrence 3 years following surgery. Flocks has recently presented an excellent study on the problem of early calcium urolithiasis in which he recommends the use of stone-dissolving agents. Irrigation through a ureteral catheter will usually break up the particles and cause them to pass. In certain patients who do not tolerate a ureteral catheter, operation may be necessary with removal of fragments and subsequent irrigations. Attempts to dissolve calculi located in the lower or mid-ureter have been abandoned because of several extremely toxic reactions. Temperatures reaching as high as 107° F. occurred, probably due to a chemical pyelonephritis. Another patient had numerous small calculi located at the ureteropelvic junction with complete blockage. He was toxic and had a high fever and chills. Attempts were made to cause spontaneous passage of the calculi by means of manipulative procedures which were not attended by success. Finally, a ureteral catheter was passed beyond the impacted calculi and irrigations were given every 5 minutes for 36 hours, and the calculi disappeared. In plastic operations on the renal

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pelvis, when a catheter is left in place for many weeks, the purpose of the operation may be defeated by calcareous deposits occluding the catheter. Solution G irrigations will maintain the patency of the tube. (J. Urol., July '47 - D. J. Abramson)

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Reiter's Syndrome: Since Reiter's original description in 1916 of an illness characterized by urethritis, conjunctivitis, and arthritis, less than 80 additional cases in 29 articles have been reported. These reports have appeared mainly from medical staffs of military installations where there were large groups of young men, in whom the disease seems chiefly to occur.

The author contends that the disease is not as rare as the general lack of knowledge and paucity of the medical literature on the subject would indicate because in a period of only two years he observed 12 cases in which the syndrome was complete and in which indisputable diagnosis could be made.

The 12 patients in this series were males whose ages ranged from 19 to 34. All stated that they had not had a similar illness previously, and such follow-up studies as were possible failed to disclose recurrence. Only one patient gave a family history of joint disease. Previous episodes of gonorrhea had occurred in 6 patients and in only one of the 6 had it occurred less than 6 months before the onset of Reiter's disease. A history of nonspecific urethritis only which had subsided promptly was obtained from 2 patients. One patient had had recurrent attacks of conjunctivitis unaccompanied by other manifestations of disease for 2 years prior to developing Reiter's syndrome.

The initial complaint in 9 patients was of urethritis. Conjunctivitis occurred simultaneously with urethral discharge in one patient, and mild diarrhea heralded the onset of the disease in another. In only one patient did arthritis appear first. The time required for the complete syndrome to develop varied from 2 to 30 days, but usually the clinical picture was complete within the first 10 days of illness.

The urethral discharge usually began as a glairy mucoid exudate which later became frankly purulent. Repeated smears and cultures were negative for gonococci in every case and at no time could any specific organism be isolated. The urethritis, in most instances, cleared up in less than 2 weeks, but in several cases persisted as long as 6 weeks. Remission of the discharge with subsequent recurrence was observed in 4 patients. Dysuria and frequency accompanied the urethritis in 50 per cent of the cases, and in the rest there was an asymptomatic discharge. Three patients developed subsequent prostatitis and 1 severe hemorrhagic cystitis. In no case in this series was involvement of the upper urinary tract observed. Circinate lesions of the penis developed in 3 cases. Superficial ulceration of the glans in one patient progressed into severe balanoposthitis, but in others the balanitis regressed spontaneously

within a week. Only one patient demonstrated skin lesions suggestive of keratodermia blennorrhagica. In this case a keratotic eruption appeared on the dorsal surfaces of both hands followed by a herpetiform rash on the palmar surfaces of the feet. The vesicles on the right foot enlarged, coalesced, and ruptured, followed by the development of a shallow ulcer. Later a hyperkeratotic lesion developed on the tip of the right third toe.

Purulent conjunctivitis was present in every case and in all but one its appearance preceded the onset of arthritis. Generally, the conjunctivitis was of mild or moderate severity with hyperemia, edema, and yellow mucopurulent discharge. Superficial keratitis was observed in one patient. Usually the severe inflammatory reaction subsided in 3 or 4 days, but in one case persisted for 2 weeks. Conjunctival scrapings were consistently negative for inclusion bodies. Cultures of the discharge were either sterile or showed growth of Staphlococcus albus.

The cardinal feature of the syndrome in every case was the arthritic phase. Invariably there was a sudden elevation of temperature accompanied by an acute onset of from severe to moderate joint pain. The affected joints were red, hot, swollen, and tender. Although in 2 cases only a single joint was involved, generally the arthritis was polyarticular and of a migratory type, simulating acute rheumatic arthritis. Most commonly the knees and ankles were affected. Less frequently involved were the wrists, hips, and interphalangeal finger joints. In one unusual case the temporomandibular joint was acutely inflamed. Hydroarthrosis of the knee was present in 6 cases. Roentgenographic studies of the affected joints ordinarily revealed only evidence of soft tissue swelling and the presence of joint fluid. In 2 cases the findings were suggestive of osteoporosis of the bone ends. Joint aspirations, carried out in 5 cases, revealed serous fluid with low protein content and containing from 10,000 to 20,000 white cells per c. mm., with a preponderance of polymorphonuclear cells. Cultures of synovial fluid were persistently sterile.

Supplementary laboratory examinations in this survey corresponded more or less to the studies in previous reports. Serologic reactions of the blood were negative in every instance. Electrocardiographic tracings showed nothing of significance in 5 studies. During the acute phase of the illness, leukocytosis with a count ranging from 10,000 to 22,000 cells per c. mm. was found, and a coincidental elevation of the sedimentation rate was observed. Blood cultures in 2 patients yielded no growth. Because of its unreliability, the complement fixation test for gonorrhea was not employed, although in every case cultures for Neisseria gonorrhoeae were taken of the exudates from the conjunctiva and urethra and, where possible, of joint fluid. Urine cultures were done on all patients, only 3 of which were positive; 2 for Staph. albus and 1 for Escherichia coli. Pyuria was present in every case at the outset, but cleared up in at least half the cases before the disease terminated. No animal inoculations were done.

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The clinical course of the syndrome appeared to follow a fairly constant pattern. Generally, the essential triad was complete within one month and the acute phase would reach its zenith in from 6 to 8 weeks. Temperature elevations were not pronounced and usually of short duration, in no case accompanied by chill. Following the acute stage, in most cases involved joints remained swollen, stiff, and painful. In only 2 cases was there exacerbation of the acute inflammatory process after initial remission. Total duration of symptoms is presumably subject to considerable variation; entirely accurate follow-up in every case has not been possible. In no case, however, was a patient fully recovered in less than 3 months, and 3 patients were still hospitalized after 4 months of illness.

This curious syndrome with its standard pattern and its variegated clinical complications presents an etiologic problem. Although a variety of causative agents has been suggested, conclusive evidence is lacking to substantiate the position of any as the responsible factor. Several investigators have proposed dysentery organisms, others streptococci and coliform organisms, and Reiter himself, an atypical spirochete. Recently Dienes and Smith isolated a pleuropneumonia-like organism which is apparently associated with genito-urinary infections and may have significant relationship to the Reiter complex. Such bacteria, however, were not discovered in the cases reported upon here.

This disease would seem to be confined to young men, although one dubious case in a female was described by Lever and Crawford. The epidemiology remains obscure. In a consideration of geographic distribution, Vallee finds that cases have been reported from western Europe, the United States, and the Pacific Islands.

Pathologic examination of the synovia of the involved joints has been carried out in only 3 cases. Hollander and his associates, who performed arthrotomy and biopsy in one patient, report that the synovial membrane was congested and presented a reddish purple appearance. No gross thickening was observed, but several areas of white fibrinous material were present on the surface of the synovial membrane. A severe inflammatory reaction which was limited to the superficial synovial layers was noted upon microscopic examination. Their report says the synovial membrane was thrown into large club-like projections in which abundant capillaries were dilated. Each projection was distended by a heavy infiltration of lymphocytes mixed with a few plasma cells and neutrophils. There was no evidence of exudate. The intima was found to be several cells deep. There were no new capillaries and the marked hyperemia consisted of dilatation of the pre-existing capillaries. These findings agree with those reported earlier by Bauer and Engleman, and by Wepler.

Specific therapy for Reiter's syndrome is unknown. Penicillin, sulfonamides, arsenicals, salicylates, and fever therapy have all been employed recently. Effective therapeutic efforts have thus far been limited to analgesics

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and palliative measures directed at symptomatic relief.

Despite the unavailability of specific treatment, prognosis in general is good. No death directly ascribable to the disease has been reported. Although recurrences of the syndrome are known to occur months and even years after the original episode, each attack is generally self-limited in its course without residual structural or functional disorder of the affected systems. In rare instances permanent articular and ocular damage has been reported. Complicating skin lesions are uncommon and invariably are characteristic of keratosis blennorrhagica. Urologic complications are usually of a mild and transient nature.

Diagnostic accuracy demands differentiation of Reiter's syndrome from gonorrhea. Clinically, the gonorrheal syndrome presents a more severe reaction with chills and high fever. It frequently causes permanent joint damage, but usually responds to chemotherapy. Nevertheless, the only indisputable evidence in differential diagnosis is determined by meticulous bacteriologic studies, since in Reiter's disease gonococci are never found. (Am. J. M. Sc., July '47 - B. D. Pinck)

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Stomatitis After Oral Administration of Penicillin: The recorded incidence, symptoms and types of allergic or toxic reactions associated with the oral administration of penicillin have varied widely. Symptoms observed include soreness of the throat and tongue, extreme dryness of the lips, burning sensations throughout the mouth, impaired taste, sensitivity to hot foods, exfoliative lesions and perleche-like fissures at the labial commissures. Wright and Rule have stated that the severity of the reaction may vary with the salt used. They reported thirteen instances, or 9 per cent, of toxic reactions among 151 patients treated with sodium penicillin lozenges. The reactions which developed were mild, of short duration and consisted of glossitis, papules on the tongue and soft palate, sore throat and slight nausea as well as stomatitis. These symptoms persisted from 1 to 6 days whereas, with calcium penicillin these symptoms were more severe and persisted for as long as fifty-seven days. With use of the calcium salt in the lozenges, six reactions, or 16 per cent, occurred in thirty-eight patients treated. Goldman reported a case in which cheilitis developed in a patient after use of a solution of sodium penicillin as a mouthwash. Goldman and Farrington reported two cases of stomatitis and glossitis resulting from the oral administration of calcium penicillin tablets. They also have described their experiences in contact testing of the buccal mucous membrane with penicillin. In the authors' experiences treatment with penicillin by mouth in 28 patients with various diseases of the skin or mucous membranes resulted in 4 instances, or 14 per cent, of stomatitis or glossitis when lozenges or tablets of 2 commercial brands of calcium penicillin were used.

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As the oral use of penicillin becomes more frequent, it is important that those who prescribe it be cognizant of the oral manifestations and different types of hypersensitivity or toxic reactions which may be encountered.

Stigmata suggestive of vitamin deficiency may be confused with stomatitis venenata, fungous infections of the mouth, such as are seen with Aspergillus nigricans, or with the effects of mouthwashes containing irritants or coloring matter as well as the effects of penicillin. Such changes as edema, redness, congestion and hypertrophy of the papillae may occur either in avitaminosis, or from the local effect of penicillin or other drugs in cases of hypersensitivity.

Until the recent development of suitable technics, direct testing of the buccal mucous membranes and attempts to correlate some causes of stomatitis with hypersensitivity had been avoided either because of the relative inaccessibility of these membranes or because of their insensitiveness to physical or chemical stimuli which ordinarily do not affect the skin. During the authors' experiences with penicillin used in the oral treatment of disease, however, it became apparent that the determination of cutaneous hypersensitivity alone was an inadequate criterion of the sensitivity of the mucous membrane. Stomatitis occurs independently of dermatitis. They also have seen allergic, bullous, ulcerative, inflammatory oral lesions complicating a severe exfoliative dermatitis caused by penicillin. Various types of dermatitis may follow or accompany oral administration of penicillin in the absence of stomatitis. As the need for more information concerning the nature and properties of the buccal mucosa as a shock tissue in penicillin hypersensitivity becomes more urgent, increasing use is being made of the original technic of Goldman and Goldman or its modifications for contact testing in suspected cases of stomatitis venenata caused by penicillin. The authors believe, however, that in actual clinical practice proved cases of stomatitis caused by penicillin must be rare when the frequent oral and topical use of this antibiotic is considered. The high incidence encountered by the authors was more apparent than real, since 3 patients were given penicillin orally only after they had shown epidermal evidence of penicillin hypersensitivity. In the case of these three patients it was felt that the buccal mucosa shared in a generalized cutaneous hypersensitivity to penicillin. The stomatitis was explosive, coming on after from 2 days to 3 months of continuous and intensive oral treatment with penicillin. Pain or tenderness of the tongue was at times a prominent symptom, but in no case were significant alterations of the lingual papillae noted. The inflammatory reaction was symmetrical and diffuse. The buccal mucosa and tongue were fiery red and edematous, but the entire process receded rapidly and disappeared in from 2 to 6 days after administration of penicillin was discontinued.

An increasing number of case reports is accumulating in the recent British medical literature, citing evidence of niacin deficiency associated with penicillin administered orally. Bedford has reported 2 cases in which melanoglossia complicated the ingestion of penicillin tablets. Three additional cases are reported by Ellinger and Shattock who observed evidence of generalized niacin deficiency after oral administration of penicillin. Since it had been established that up to

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two thirds of orally administered penicillin may reach the colon unaltered, it was postulated that penicillin given by mouth could produce a niacinamide deficiency with lingual manifestations by its action on the intestinal flora or enzyme systems. All symptoms and signs of avitaminosis receded rapidly after niacinamide was administered parenterally. A later report correlates depression of the urinary output of niacinamide methochloride with ingestion of penicillin.

Experimentally, the authors were able to duplicate in one patient the lingual findings cited in the British reports, but only after a five-day period of continuous contact of calcium penicillin lozenges with the tongue. In their opinion, the changes observed were probably caused, at least in part, by a local effect of the antibiotic. Vilter and Vilter, as well as other observers of this case, concur in this opinion. The black color did not appear to be a bacterial or fungous film but rather an intra-epithelial pigmentation which could not be rubbed off. As in Bedford's patients, the surface of the tongue was covered with a dark brown or blackish fur, but the edges and tips remained clean. Over the posterior surface the color was darkest, almost black, had a moth-eaten, velvety appearance, and was covered with a brown detritus, which in this case could not be removed by rubbing with gauze or a towel.

The fact that, in the three patients cited by Bedford and in this one patient, penicillin was in contact with the tongue for a long period of time seems significant. Numerous other causes for blackish discoloration have been described and should be ruled out before lingual pigmentary disturbances are ascribed to penicillin.

The duration of potential hypersensitivity reactions to the oral administration of penicillin has not been determined. The local effect causing the darkening of the tongue is still under investigation and will be reported at a later date. There was no history from the authors' patients of a vitamin-deficient diet but niacin levels in blood or urine were not determined. No additional signs common to human niacin deficiencies were observed. For each patient a correlation between penicillin stomatitis and a positive reaction of the buccal mucosa to contact testing with the antibiotic was established. The authors believe that sufficient proof is offered to classify these reactions as examples of true allergic responses to penicillin rather than as manifestations of avitaminosis or other specific constitutional disturbances. Stomatitis venenata caused by penicillin is similar to that when caused by other agents. Unless a disease process, either local or general, gives a well defined indication for the oral use of penicillin, this antibiotic should be avoided or administered with circumspection. This is especially true for all patients showing vascular or epidermal evidence of penicillin sensitivity. The reason for the apparently greater susceptibility of the face and mouth to sensitivity reactions from contact with penicillin as compared to other body regions and mucosal structures is not clear. Pierce, for example, has used vaginal suppositories, containing 300,000 units of penicillin, for over 500 patients immediately after delivery, without encountering a single toxic or allergic reaction. This is in marked contrast to the relatively high incidence

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of hypersensitivity or toxic reactions reported after oral administration of the antibiotic. (J. Oral Surg., April '47 - J. Farrington et al.)

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Prevention of Repeated Miscarriage: There is a tendency to blame the frequent miscarriages in many instances on defective fetuses without realizing that there is probably a good cause for the abnormality in the fetus. The authors incline to the theory of Mall that many miscarriages are due to faulty implantation and believe that the invasiveness of the trophoblastic layer is dependent upon the amount of stimulation that it receives from the anterior pituitary and the placenta; in other words, the depth and strength of attachment of the placenta depend upon the amount of gonadotropin produced, either by the anterior pituitary or by the placenta. The authors have performed Aschheim-Zondek tests on women who were approximately 6 weeks past the last menstrual period and presumably pregnant but who, on vaginal examination, manifested no evidences of pregnancy. The test animals showed a negative or only a moderate follicular stimulation. When a test was made again two weeks later, it was strongly positive. This absence of a positive pregnancy test at a time when normally a fully positive response would be expected is undoubtedly due to lack of gonadotropin production, and the authors believe that it is most likely to occur in those women who have a considerable genital hypoplasia and in whom the uterus barely reaches a normal size at six weeks' gestation. It is not unusual to find in this group with hypoplasias some defect in the production of a good uterine progestational phase, although a poor luteal phase is not ruled out by the absence of genital hypoplasia. It is generally agreed that the production of gonadotropin is highest in the first trimester of pregnancy with a gradual decrease thereafter. There is some evidence to show that estrogen and progesterone are produced in the syncytial cells. It is also known that a large percentage of miscarriages occur during the so-called "danger period" around three or three and one-half months of pregnancy, at a time when the corpus luteum of pregnancy is degenerating and the placenta is taking over its function. It is reasonable then to believe that insecure implantation of the placenta would result in insufficient production of the hormones necessary to the life of the pregnancy and bleeding at the site of the poorest syncytial penetration, i.e., separation of the placenta. Reduction in corpus luteum excretion and estrogen production frequently precede death of the fetus and miscarriage. It has often not been possible to recover a fetus even though the patient has been followed from the beginning of bleeding, and it is believed that the same phenomenon takes place as in the rabbit, namely, resorption of the fetus.

The authors believe that Rh incompatibility does not produce miscarriage.

No vitamin E was given to any patient in this series.

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They have on occasion given very large doses of estrogens to patients during early pregnancy. In no patient have they interrupted pregnancy even with doses of 200,000 R.U. of progynon B given in a period of from 7 to 10 days. However, they had one patient who had cramps after the administration of 30,000 R.U., at 5 months' gestation and therefore discontinued the medication.

Vaux and Rakoff reported good results in treatment of repeated miscarriage with estrogen-progesterone therapy as have the authors for the most part except for several failures, including some in patients whom they subsequently have carried through successfully on the medication indicated in this paper. The authors had two failures in one patient on estrogen-progesterone therapy when they did not take into account the general physical make-up of the patient, namely, tall, heavy bones, masculine pelvis, rather stout, with girdle obesity, and other evidences of hypopituitarism.

Rutherford has brought out an excellent point with which the authors are in complete accord, namely, that a patient who has miscarried is entitled to a thorough work-up to find wherein she fails, wherein her genital system is unable to carry the load of pregnancy, or even function normally during the nonpregnant state. Unfortunately too many good obstetricians and gynecologists do not check their patients carefully after a miscarriage. Every woman who has miscarried twice, or in whom there is evidence of some endocrine disturbance should have the following tests performed at a time when she is not pregnant: (1) basal metabolic rate, (2) sugar tolerance (three-hour test), (3) endometrial biopsy (premenstrual), and (4) general physical examination and vaginal examination to determine the existence of genital hypoplasia. At the same time there should be examination of her husband's semen.

Ingram has reported his results with pregneninolone and vitamin E which were favorable in a moderate proportion of cases. The authors' experience with pregneninolone was less fortunate, since a few miscarriages occurred after doses of from 20 to 30 mg. daily had been employed. They did not combine the pregneninolone with vitamin E, however. They do not believe that pregneninolone is an actual substitute for corpus luteum hormone in the form of progesterone by injection. Incidentally, they have one patient who has been taking 20 mg. of pregneninolone daily in the second half of the cycle for the past four or five months, and who noted increased growth of hair on her arms. They discontinued the medication, temporarily. Although pregneninolone has possibilities of triple action, estrogenic, luteal, and androgenic, it is not known which action will result in the body.

Smith, Smith, and Hurwitz have reported increased excretion of pregnandiol in pregnancy from administration of diethylstilbestrol. The authors believe that the natural estrogens act in the same manner. They have used ethinyl estradiol in a few cases, in place of alpha-estradiol, with satisfactory results. The dosage in those cases was 0.05 mg. of ethinyl estradiol three times daily. There were no cases of nausea or other untoward effects.

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R. Kurzrok has reported very excellent results in the treatment of repeated miscarriage with estrogen administered orally, and a combination of corpus luteum hormone, prolactin, and chorionic gonadotropin given by injection. The authors' results are comparable in percentage of salvage, and they have followed through on similar therapy, with the exception of the prolactin which was not used in this series. The authors' dosage of corpus luteum hormone was higher than the average amount Kurzrok gave, although they are working on a group of cases now, using smaller amounts of corpus luteum hormone, namely, 2 mg. per injection.

In this series 27 women who had had repeated miscarriage were treated by the administration of anterior pituitary-like hormone (APL), corpus luteum hormone (CLH), and estrogen. These women had miscarried from one to three times previously.

Treatment in these cases was begun as soon as a diagnosis of pregnancy was established or suspected, and consisted of the following:

Anterior pituitary-like hormone, from 1,000 to 2,000 units, was administered 3 times a week until 4 and 1/2 months' gestation, then 1,000 units twice a week until 8 months' gestation.

Corpus luteum hormone, 5 mg., was administered 3 times a week until 4 and 1/2 months' gestation, then twice a week until 8 months' gestation.

Alpha-estradiol, from 1/2 to 1 mg., was administered daily, depending upon the extent of uterine and genital hypoplasia present. In a few cases, ethinyl estradiol, 0.05 mg., was given 3 times a day instead of alpha-estradiol with no apparent difference in effect.

In the 27 cases treated there were no interruptions of pregnancy. Miscarriage did not take place, although there were patients who bled even during treatment. The authors do not believe the treatment outlined is a panacea for all miscarriages, nor does it preclude further improvements and changes as concepts, knowledge, and the armamentarium improve and grow. The babies delivered were normal, with the exception of one, who was a Mongolian idiot. weighing 5 pounds 10 ounces at birth 10 days before term.

Histories of two more or less representative cases of the authors' series follow:

B. S., age 28, para one, gravida 4, had 3 miscarriages from 2 and 1/2 to 3 and 1/2 months' gestation. With the fourth pregnancy, the patient had vaginal bleeding early in gestation in addition to a complication of phlebitis of both legs with fever. She was carried to term under therapy, and a cesarean section performed because of a breech presentation, ruptured membranes, and a long, slow, poor labor. The child was normal.

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B. S., age 24, para one, gravida 2, had a miscarriage at 2 months with the first pregnancy. She was placed on therapy during the second gestation, when she began to stain and had a brownish discharge at 6 weeks. The patient was carried to term and delivered by low forceps of a normal male child weighing 7 pounds 9 ounces.

In this series there were no postpartum hemorrhages, nor were there any unusual complications during labor or puerperium. The type of delivery was unaffected. Cesarean section was performed in 4 cases.

Labor did not set in earlier than 10 days after discontinuance of the injections. In most cases, there was a lapse of approximately 3 weeks. In several other cases in which CLH had been given without APL, bleeding occurred about 3 weeks after stopping of the therapy, at 4, 4 and 1/2, and 6 months, respectively.

The authors are inclined to give their more recent patients larger doses of APL in the early months, namely, 2,000 units 3 times a week, and hope that this will tend to prevent the bleeding which sometimes occurred in the first trimester.

Therapy for repeated miscarriage should be prophylactic. Treatment begun after miscarriage has already threatened is, in many instances, hopeless, since the condition of the fetus is often beyond help or entirely resorbed; however, treatment should be instituted until a definite diagnosis can be made because some patients in this condition will be carried through successfully.

Many patients other than those presented in this paper, who presented evidence of endocrine dysfunction, and considered quite likely to miscarry, have been treated by the authors prophylactically, using the therapy as outlined during pregnancy with excellent results. (Am. J. Surg., Aug. '47 - L. Kurzrok and C. Birnberg)

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Reports on USN Research Projects: (Not Restricted)

A Field Test of the Use of Filters in Penetrating Haze: As one phase of the field studies of optical equipment, a study was made on the effectiveness of selected neutral and color filters in "cutting haze," that is, in extending the visual range at which targets may be discriminated in the presence of haze through the selective absorption of light of different wavelengths. The test filters were sealed between optical flats in clip-mounts which could readily be fitted over the objectives of the standard 7 x 50 x 7 binocular.

It was found that in the discrimination of neutral targets, illuminated by the sun at various angles of incidence, or by an evenly illuminated overcast sky and under a variety of visibility conditions, filters cutting off the short-wave end of the spectrum show no effect of "haze-cutting." This result was obtained at a range of some 3.5 sea miles.

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Filters as dense as 1.00 log units (which reduce sky brightness to 10 per cent of its full value) do not impair performance under any condition of visibility studied. Denser filters, whether neutral or red, may affect performance adversely to a slight extent.

These conclusions are valid whether the eye is adapted to the filter or not; there is no indication of a specially favorable effect during the first few seconds of use of a filter. (NM 011 003, 6 June '47, M. Res. Dept., U.S. Sub. Base, New London, Conn. - W. S. Verplanck)

(Not Restricted)

Caloric Requirement of Man in Cold Climates. It is a common observation that men in cold climates require and consume a greater amount of food than men in a warmer environment. They have a higher energy metabolism. Various explanations for this have been proposed, such as: (a) the body responds to the cold by raising the metabolism, thus requiring a greater food intake, or (b) increased exercise and muscle tone to maintain body temperature accounts for the increased energy metabolism, thus requiring a greater food intake.

It is probable that neither of the two above explanations are correct except under certain conditions, but rather, that a considerable amount of body heat is lost in cold climates in warming the inspired air to body temperature and in humidifying it. This heat is lost from the body when the warm and humid gases are exhaled.

There may be certain situations in which conservation of this sensible and insensible heat may mean the difference between life and death; and it may be possible to conserve and utilize this heat by, for example, exhaling the warm and humid gases into the garments, or into some type of face mask. This may utilize the sensible heat by simple transfer, and the insensible heat by condensation of water vapor at some place where the dew point is reached.

In the report basic equations are given for estimating the heat necessary to warm and humidify the inspired air at various air temperatures, and for the fraction of the total energy metabolism involved in this process. Using these basic equations, assumptions are made for the parameters, and estimations of the actual energy and percentages of metabolism (under the conditions of the assumptions) are tabulated and plotted. Different values from those tabulated might be obtained for different assumptions on the parameters, or if more certain values can be obtained from laboratory work. Also, for animals other than man, the most suitable values of the parameters should be used.

From the equations and estimations of the heat necessary to warm and humidify the inspired air, tables and graphs have been prepared showing the increase in caloric requirement (food intake) of man which might be expected (in cold climates) at various air temperatures.

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Hypothetical equations and calculations are given for the ratio of survival time with conservation of the heat necessary to warm and humidify the inspired air to the survival time without conservation of the heat required to warm and humidify the inspired air. (Proj. X-766, NM 013 009, Rep. No. 1, Research Div., BuMed - A. P. Webster)

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Yeast Microbiological Method for the Determination of Nicotinic Acid. In this study a microbiological method for the determination of nicotinic acid using a yeast, Torula cremoris, is presented. The method is rapid, from 16 to 18 hours being allowed for growth, and possesses the advantage of ease of estimation of response by turbidimetric means. The method satisfies the usual criteria of specificity, and its use for the differential assay of nicotinic acid, trigonelline, and N^1 methylniacinamide in mixtures is indicated. (Proj. X-704, Rep. No. 1, 1 Nov. '46, Nav. Med. Res. Inst., Bethesda, Md. - W. L. Williams)

(Not Restricted)

A Modification of an Oral Photographic Apparatus Originally Constructed by the Dental School, University of Pennsylvania. From 1939 to 1943 different types of still photographic apparatus have been tried in the Naval Dental School for photographing oral lesions and deformities. This was done in conjunction with a visual educational program which was being vigorously pursued.

Although apparatus for routine, clinical, still photography was available in the Navy, it was extremely difficult to obtain close-up photographs of the oral cavity. Most pictures included the head and shoulders of the patient and little or no detail of oral lesions could be obtained.

The first oral photographic device which showed promise of being easy to manipulate was that constructed by the department of oral medicine, University of Pennsylvania Dental School. An adaptation of this apparatus was constructed by the Philadelphia Navy Yard and used to make photographs of oral lesions. The resultant transparencies served as controls in a study of oral fusospirochetosis. This apparatus automatically related the light intensity and the distance from object to the lens by a measuring device which did not have to be removed in order to make the exposure. It was portable, in that exposures could be made while holding the apparatus, and thus photographs could be made regardless of the position of the patient. Several models, using the basic principles of the apparatus constructed by the University of Pennsylvania, with variations including refinements and adaptation to different cameras, have been constructed and are now in use.

Since the results obtained with this apparatus have been successful and rather easy to obtain by inexperienced personnel, it was decided that detailed plans for construction and operation of the device should be made available to naval activities. In this way such an apparatus might be constructed in any

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naval station where a machine shop is available. Such plans are included in the original report. (Proj. X-767, Rep. No. 1, 18 March '47, Nav. Med. Res. Inst., Bethesda, Md. - C. A. Schlack)

NOTE: Those interested in seeing copies of the complete reports should address their request to the research activity from which the report originates.

Opinions or conclusions contained in these reports are those of the authors. They are not to be construed as necessarily reflecting the views or the endorsement of the Navy Department. Reference may be made to those reports marked "Not Restricted" in the same way as to published articles, noting authors, title, source, date, project number, and report number. No part of the content of RESTRICTED reports may be published, reproduced, or referred to in articles for publication without permission obtained through the Bureau of Medicine and Surgery.

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Training for Reserve Medical Officers: The Bumed News Letter of 4 July 1947 contained a description and list of opportunities for training available to Reserve medical officers. Reserve medical officers are urged to familiarize themselves with the possibilities for training during their period of active duty. No service agreement is required for training in the following specialties: aviation medicine, electro-encephalography, photofluorography, and submarine medicine. The training received in submarine medicine in the Navy is regarded as constituting an excellent basis for further study and training in research in the Navy. Requests are desired from interested medical officers.

On 1 July 1947, the eligibility requirements for training in physical medicine, preventive medicine, industrial medicine, and medical statistics were changed in order to allow the younger medical officers (including junior grade lieutenants) to apply for training in these specialties in civilian institutions. The American Board of Physical Medicine is the latest Specialty Board to be formed. Master's Degrees in Public Health are offered in preventive medicine, industrial medicine, and medical statistics. Reserve medical officers who are interested in these specialties and who request transfer to the regular Navy are eligible to apply for and receive training in a civilian institution pending their transfer to the regular Navy, providing a 3-year service agreement accompanies the request.

Inquiries regarding these specialties are invited from interested medical officers. (Professional Div., BuMed)

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Forms Used by Dental Activities: The Dental Division of the Bureau of Medicine and Surgery is preparing to make an analysis of the forms which are now being used by dental activities and which do not have a NAVMED or other identifying number of the Navy Department. The purpose of this study is to ascertain which forms may be standardized. It is requested that all dental activities that are using locally designed forms, which are produced by ditto, mimeograph, printing, or other duplicating process, submit one copy of each form to the Bureau. The following data should appear on each form:

(a) Name of ship or station where the form is being used.
(b) Quantity of each form used in 12 months.
(c) Any explanatory data which may be pertinent.

(Dental Div., BuMed)

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Reports from Dental Departments: The following table listing the principal reports required from dental departments afloat and ashore has been compiled to provide a convenient reference for dental officers. The several special reports required from district dental officers, staff dental officers, and dental officers in command are not included in this table. All dental officers are urged to review carefully every report for accuracy of entries before forwarding.

PRINCIPAL REPORTS REQUIRED FROM DENTAL DEPARTMENTS ASHORE AND AFLOAT

FORM	NAME	TO	WHEN	PREPARATION REFERENCE
NAVMED-D	Transfer of property custodcy	*BuMed (orig. only)	When property transferred due to change of DO	BuMed C.L. 45-173
NAVMED-H-4	Dental record	Health record, copy to BuMed	Enlistment, re-enlistment, extension of enlistment, appointment, promotion, discharge, etc.	2227-2231 MMD
NAVMED-HC-3	Receipt, transfer & status card (Hospital Corps)	*BuMed (orig. only)	As required	517 MMD
NAVMED-HC-4	Roster report of the Hospital Corps	*BuMed (orig. only)	Monthly	518 MMD
NAVMED-K	Report of dental operations and treatments	*BuMed (orig. only)	Monthly	5112 MMD
NAVMED-L	Report of prosthetic dental treatment	*BuMed (orig. and card duplicate)	Monthly (enclose with NAVMED-610)	1338 MMD
NAVMED-4	BuMed material requisition	Nearest NAVMED supply depot (in triplicate)	When required	BuMed C.L. 47-33
NAVMED-461	Semiannual dental report	*BuMed (in duplicate)	1 April and 1 October	On form
NAVMED-610	Monthly prosthodontia report	*BuMed (orig. only)	Monthly	1340 MMD
NAVMED-785	Semiannual dental officer personnel report	*BuMed (orig. only)	1 July and 1 January	1342 MMD
Special Letter	Annual dental report	*BuMed (in duplicate)	1 January	5130 MMD
Letter	HC specialty training, recommendation for	District Comdt. or admin. command	Monthly	5136 MMD
Letter	Dental treatment for humanitarian reasons	*BuMed (orig. only)	Monthly (enclose with NAVMED-K	5112.4 MMD
Letter	Inventory, decommissioning	*Records management center (copy to BuMed)	When decom. or disestablished	12B11 MMD
NAVSandA	Survey of property	*MatDiv, BuMed	As required	3074-3077 MMD

*Send copy to cognizant staff or district dental officer.

Dental officers should review Part V, Chapter 1, of the Manual of the Medical Department for additional information regarding reports. (Dental Div., BuMed)

(Not Restricted)

Guam Hospital Dental Service Approved: The Bureau has information that the Dental Service of the U. S. Naval Hospital, Guam, has been approved by the Committee on Hospital Dental Service of the American Dental Association. This is the first approval of a dental service of a naval hospital to come to the attention of the Bureau. The basic standards required for approval by the committee were contained in the 20 December 1946 issue of the Bumed News Letter in an article that encouraged naval hospitals to institute the necessary procedures for meeting those standards and to apply for certificates of approval for their departments of dentistry. (Dental Div., BuMed)

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(Not Restricted)

Manuals and Publications Available in Dental Activities: All dental activities should have office copies of certain essential publications, literature, circular letters, correspondence, etc., which are routinely necessary for reference use in the efficient administration of the activity and for the instruction and training of dental personnel. It should not be necessary for dental officers to transport voluminous personal files of official reference literature. Office copies of manuals should be kept up to date; supplements and corrections should be procured from the administrative office of the commanding officer.

The following are examples of manuals, publications and literature which are considered to be essential:

a. U. S. Navy Regulations.
b. Navy Department General Orders.
c. Manual of the Medical Department, U. S. Navy.
d. Bureau of Medicine and Surgery Section of the Catalog of Navy Material.
e. Bureau of Naval Personnel Manual.
f. Naval Courts and Boards.
g. Navy Department Bulletin, cumulative editions.
h. Navy Department Bulletin, current issues
i. Manual of the Hospital Corps, U. S. Navy.
j. Handbook for Dental Technologists, General
k. Handbook for Dental Technologists, Prosthetic.
l. Bulletin Bureau of Medicine and Surgery Circular Letters.
m. Bumed News Letter, in binders with indexes.
n. Manual for Stenographers and Typists, Navy Department.
o. Register of Commissioned and Warrant Officers of the United States Navy and Marine Corps.
p. Register of Commissioned Officers, Cadets, Midshipmen, and Warrant Officers of the United States Naval Reserve.
q. Files containing pertinent current AlNavs, circular Letters, and memoranda from various offices, bureaus and authorities of the Navy Department which apply to dental activities.
r. Files for local orders, memoranda, correspondence, etc.

(Dental Div., BuMed)

Circular Letter 47-103 7 August 1947 (Not Restricted)

To: All Shore Stations having Medical Department Allotments, Fiscal Year 1948, including Naval Hospitals.

Subj: Recording and Reporting of Salaries of Group IVb Civilian Employees Chargeable to Appropriation, Medical Department, Navy.

Refs: (a) BuMed Ltr LL/L1-2(093-42) dated 25 September 1945.
(b) BuMed CirLtr 47-98 dated 1 August 1947, with enclosures.

1. Reference (a) is hereby cancelled.

2. Complete instructions for recording and reporting of salaries of Group IVb civilian employees chargeable to Appropriation Medical Department, Navy for Fiscal Year 1948 and subsequent fiscal years are contained in reference (b) with enclosures.

--BuMed. H. L. Pugh

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Circular Letter 47-104 7 August 1947 (Not Restricted)

To: All Ships and Stations

Subj: Cancellation of Certain Bureau of Naval Personnel and Bureau of Medicine and Surgery Joint Letters.

Encl: (a) List of Joint Letters of BuPers and BuMed cancelled.

This letter, issued jointly by the Chief of BuMed and the Chief of BuPers cancels certain of their letters issued in 1944 and in 1945 as designated on a separately enclosed list. See Navy Department Bulletin of 15 August 1947.

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Circular Letter 47-105 12 August 1947 (Not Restricted)

To: Medical Officers in Command, All Naval Hospitals

Subj: Transfer of Navy and Marine Corps Patients to Veterans Administration Hospitals; Physical Evaluation Prior to Effecting.

Refs: (a) Par 3330.3 Manual of the Medical Department.

(Not Restricted)

Refs: (b) BuMed-BuPers Joint Ltr 27 Jan 1943, Bul BuMed CirLtrs, Item 43-117.
(c) BuMed-MarCorps Joint Ltr 19 Aug 1943, Bul BuMed CirLtrs, Item 43-136.

1. The provisions of reference (a) require certification by Boards of Medical Survey that transfer to a Veterans Administration Hospital for continued treatment will not endanger life or recovery.

2. As a further safeguard against effecting the transfer of naval patients to Veterans Administration Hospitals in whose case physical condition may have deteriorated during the interim between submission of survey and the designation of a facility by the Veterans Administration, it is directed that a full and complete evaluation of patients' physical condition in the light of distance and mode of travel be accorded each such patient immediately prior to effecting transfer.

--BuMed. C. A. Swanson

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Circular Letter 47-106 15 August 1947 (Not Restricted)

To: All Ships and Stations

Subj: Quarantine Procedures, Revision of.

Ref: (a) Part III, Chapter 5C, Manual of the Medical Department.

1. Quarantine procedures applicable to the Navy are being revised and regulations pertaining thereto are being republished as General Orders.

2. General Order No. 243 (Fruit, Vegetable and Plant Quarantine Regulations), and General Order No. 248 (Transportation or Retention of Cats, Dogs, Monkeys, and Other Living Animals on Board Naval Vessels and Aircraft) have been published. At an early date, additional General Orders will be issued to cover the following:

Quarantine Regulations for Naval Vessels
Quarantine Regulations for Naval Aircraft

3. Upon the issuance of the above General Orders, such provisions of reference (a) which may be in conflict therewith are canceled.

4. Reference (a) is being revised to conform with the provisions of the new General Orders.

--BuMed. C. A. Swanson

Circular Letter 47-107 15 August 1947 (Not Restricted)

To: All Naval Stations Continental

Subj: Nonstandard (Nonlisted) Medical Supplies and Equipment, Procurement of.

Refs: (a) SecNav ltr of 17 Dec 1945; N. D. Bul of 31 Dec 1945, 45-1919.
(b) BuMed CirLtr 46-48 of 27 Feb 1946, 46-461.
(c) BuMed CirLtr 47-33 of 17 Mar 1947.

This letter from the Deputy and Assistant Chief of BuMed states that revised procurement methods established by the Army-Navy Medical Procurement Office necessitate certain changes relative to the procurement and acknowledgment of receipt of nonstandard medical supplies and equipment. Reference (b) is cancelled. Instructions are given for effecting the procedures involved in the changes incident to the revised methods of the Army-Navy Medical Procurement Office. Ships and shore stations outside the continental United States are not included in the above procedure, and they will continue to receive nonstandard medical supplies and equipment in the usual manner through Naval Medical Supply Depots, Brooklyn, N. Y., or Oakland, California.

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Circular Letter 47-108 15 August 1947 (Not Restricted)

To: All Medical Department Activities

Subj: Civilian Awards Certificates, Recommendations for.

Ref: (a) BuMed CirLtr No. 47-50, 21 Apr 1947

1. Attention is called to reference letter requesting recommendations in appropriate cases for awarding certificates to civilians (non-employees) and civilian firms and organizations in recognition of outstanding and meritorious services rendered to the Medical Department of the Navy during the World War II period.

2. From the responses received it would appear that there might be some misunderstanding as to the responsibility of individuals to initiate the recommendations in cases that came to their attention, or possibly that the referenced letter was not thoroughly circulated to the heads of the respective departments of all medical activities.

3. It is also realized that due to change of duty of officers during the war and since the cessation of hostilities, it is probable that instances existed at the various stations of cases worthy of such recognition, concerning which the current staff does not have personal knowledge; and those having such knowledge

(Not Restricted)

who have been transferred to other duty are probably assuming the matter will be taken care of by their successors.

4. It is accordingly suggested that reference letter be reviewed, and that any officer having knowledge of outstanding services rendered to the Medical Department generally, or to the individual activity over which he had charge or to which he was attached during the war period, feel free to make recommendation that an appropriate certificate be awarded. The possibility of a duplication of recommendations in some cases is preferable to the omission of recognition in worthy cases. In fact such duplication conceivably can be of assistance in evaluating the services for which the recommendation for award is made.

5. In order that the Committee on Awards may conclude its assignment by the end of this year, all recommendations for awards should be submitted to the Bureau as early as practicable, and not later than 30 November 1947.

--BuMed. C. A. Swanson

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To: All Ships and Stations 25 July 1947 (Not Restricted)

Subj: U.S. Naval Dispensary, San Francisco, Calif., Establishment of

1. The following activity is hereby established, under a medical officer in command:

U.S. Naval Dispensary,
50 Fell Street,
San Francisco,
California. 2829-708

This activity is under the military command and coordination control of the Commandant, Twelfth Naval District, and is under the management control of the Bureau of Medicine and Surgery.

2. Bureaus and offices concerned take necessary action.

--SecNav. James Forrestal

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